**Small Business Innovation Research/Small Business Tech Transfer**

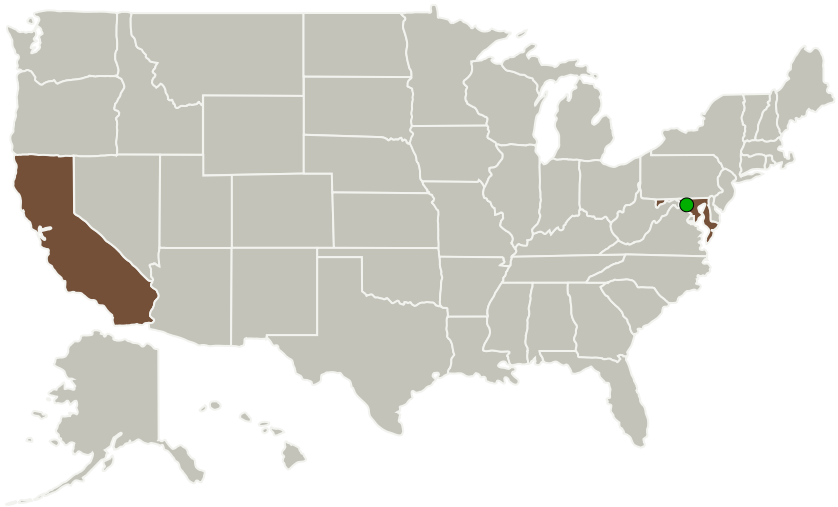
# Portable Atmosphere Scanning LIDAR, Phase I

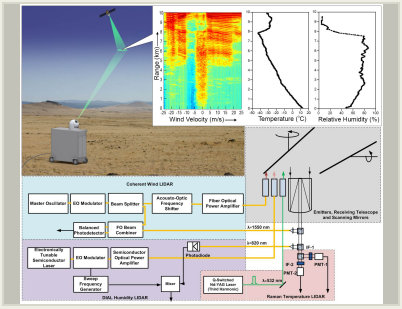
Completed Technology Project (2017 - 2017)

## Project Introduction

To address the NASA need for innovative instrumentation to support its current and future missions related to the investigation of Earth's ecosystem, Physical Optics Corporation proposes to adapt its portable, robust, ground-based light detection and ranging (LIDAR) weather system to measure winds, temperature, and humidity in a 3D volume with the ability to scan horizontally and vertically with a range of up to 10 km. The proposed Portable Atmospheric Scanning LIDAR (PASL) system will include POC's recent developments in coherent LIDAR for wind sensing, Differential Absorption LIDAR (DIAL) for measurements of water vapor content distribution, and Rotational Raman LIDAR for temperature measurements. POC's existing and proposed innovations in the integrated LIDAR designs will provide NASA with a system with very low size, weight, and power consumption, which will make the PASL easily deployable to any place on the globe and capable of long-term autonomous operation in support of NASA's research missions. In Phase I, POC will refine its existing non-scanning system and modify its design to facilitate 3D scanning, extend its functional range of operation to 10 km, further develop software for fast data processing, and fabricate a prototype of the wind LIDAR (TRL-4). In Phase II, the operational prototype of the entire scanning PASL system will be fabricated and tested (TRL-6).

## Primary U.S. Work Locations and Key Partners





Portable Atmosphere Scanning LIDAR, Phase I Briefing Chart Image

## Table of Contents

# Portable Atmosphere Scanning LIDAR, Phase I

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Physical Optics Corporation | Lead Organization | Industry | Torrance, California |
| Goddard Space Flight Center(GSFC) | Supporting Organization | NASA Center | Greenbelt, Maryland |

| Primary U.S. Work Locations | |
|---|---|
| California | Maryland |

## Project Transitions

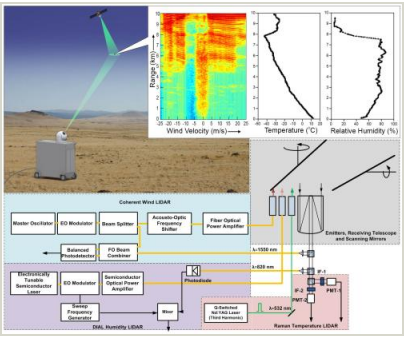
**June 2017:** Project Start

**December 2017:** Closed out

**Closeout Documentation:**

- Final Summary Chart*(https://techport.nasa.gov/file/140767)*

## Images



**Briefing Chart Image**
Portable Atmosphere Scanning LIDAR, Phase I Briefing Chart Image
*(https://techport.nasa.gov/image/129202)*

## Organizational Responsibility

**Responsible Mission Directorate:**
Space Technology Mission Directorate (STMD)

**Lead Organization:**
Physical Optics Corporation

**Responsible Program:**
Small Business Innovation Research/Small Business Tech Transfer

## Project Management

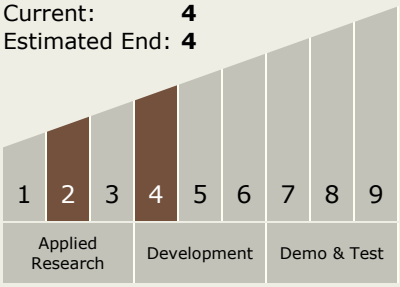
**Program Director:**
Jason L Kessler

**Program Manager:**
Carlos Torrez

**Principal Investigator:**
Victor Grubsky

## Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.4 Environment Sensors

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System